

## REPORT

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repeated measurements. Therefore, determination of the isotopic composition for all samples was carried out only on the SO ions. Two series of independent measurements were carried out at different times. The ratio of  $S^{34}$  to  $S^{32}$  was determined with an error not exceeding one percent, and the ratio of  $S^{33}$  to  $S^{32}$  with an error not exceeding 3 percent. With regard to the very rare isotope  $S^{36}$ , it could only be shown that it had similar concentrations in all samples. The averaged results of the measurements, compiled with consideration for the influence of various oxygen isotopes and corrections for the "voltage effect," are presented in the table below.

| Meteorites      | $S^{32}:S^{33}:S^{34}$ | Terrestrial Objects | $S^{32}:S^{33}:S^{34}$ |
|-----------------|------------------------|---------------------|------------------------|
| Saratov         | 100:0.78:4.53          | Sea water           | 100:0.81:4.60          |
| Grosslibenthal' | 100:0.79:4.56          | Volcanic sulfur     | 100:0.81:4.56          |
| Augustinovka'   | 100:0.79:4.56          | Pyrite              | 100:0.80:4.56          |
| Sikhote-Alin'   | 100:0.79:4.54          | Sulfuric acid       | 100:0.79:4.56          |
| Average         | 100:0.79:4.55          | Average             | 100:0.80:4.57          |

It is seen from the table, first, that the isotopic composition of sulfur is the same in all four meteorites and that the average isotopic composition of terrestrial and meteoritic sulfur is almost identical, as it is for the other elements which have been studied up to now, and, second, that the proportion obtained for sea water proved considerably different from all others in its indication of enrichment by the heavy isotope  $S^{34}$ . This enrichment constitutes approximately one percent, i.e., it is almost within the limits of possible measuring error, but is apparently real since it was observed for all measurements. The very fact that sea water is enriched by the heavy isotope confirms the probable existence of some process which is responsible for its enrichment. Finally, since the measurements described were twice as accurate as Nier's and the number of measurements was considerably larger, the average proportion of sulfur isotopes calculated on the basis of this table ( $S^{32}:S^{33}:S^{34} = 100:0.80:4.56$ ) is more accurate than that given by Nier, which is listed in all isotope tables (11:0.78:4.4).

## BIBLIOGRAPHY

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